

Applicati n No.: 09/761,923

Docket No.: JCLA6211

AMENDMENTSIN THE CLAIMS:

Claim 1. (Currently amended) A method of forming an opening in a dielectric layer, comprising:

providing a substrate;

forming a doped dielectric layer on the substrate;

forming an undoped dielectric layer on the doped dielectric layer;

forming a mask on the undoped dielectric layer, wherein the mask has a first opening therein for exposing a portion of the undoped dielectric layer;

performing an ion implantation step with the mask on the undoped dielectric layer, so that a doped region is formed in a portion of the exposed undoped dielectric layer below the first opening, wherein a depth of the doped region does not exceed a thickness of the undoped dielectric layer;

131 performing a chemical vapor etching step with the mask on the undoped dielectric layer to remove the doped region, thereby forming a second opening in the undoped dielectric layer, wherein the second opening that exposes a portion of the undoped dielectric layer below the doped region; and

performing a dry etching step with the mask on the undoped dielectric layer, so that the portion of the undoped dielectric layer below the doped region and a portion of the doped dielectric layer below the second opening are removed to expose a portion of the substrate.

Claim 2. (Original) The method of claim 1, wherein the doped dielectric layer includes a tetra-ethyl-ortho-silicate (TEOS) layer doped with boron (B) ions.

Claim 3. (Original) The method of claim 1, wherein the doped dielectric layer includes a TEOS layer doped with phosphorus (P) ions.

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Claim 4. (Original) The method of claim 1, wherein the doped dielectric layer includes a TEOS layer doped with boron (B) and phosphorus (P) ions.

Claim 5. (Original) The method of claim 1, wherein the doped dielectric layer includes a doped silicon nitride layer.

Claim 6. (Original) The method of claim 1, wherein the undoped dielectric layer includes an oxide layer.

Claim 7. (Original) The method of claim 1, wherein the undoped dielectric layer includes a silicon nitride layer.

B/ Claim 8. (Currently amended) The method of claim 1, wherein the step of performing the ion implantation step includes implanting boron (B) ions in thea portion of the exposed undoped dielectric layer below the first opening.

Claim 9. (Currently amended) The method of claim 1, wherein the step of performing the ion implantation step includes implanting phosphorus (P) ions in thea portion of the exposed undoped dielectric layer below the first opening.

Claim 10. (Currently amended) The method of claim 1, wherein the step of performing the ion implantation step includes implanting arsenic (As) ions in thea portion of the exposed undoped dielectric layer below the first opening.

Claim 11. (Currently amended) The method of claim 1, wherein the chemical vapor etching step includes hydrofluoric vapor etching step.

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Claim 12. (Currently amended) The method of claim 1, wherein the depth of the ion implantation region is at least 70% of the thickness of the doped dielectric layer.

Claim 13. (Original) The method of claim 1, wherein the depth of the second opening region is at least 70% of the thickness of the undoped dielectric layer.

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Claim 14. (Original) The method of claim 1, wherein the mask includes a photoresist.

Claim 15. (Original) The method of claim 1, further includes a stripping step for removing the mask after the dry etching step.

Claims 16-19 (Previously cancelled).